



ENGINE LUBRICATION DESIGN

Introduction:

From bulldozers, draglines to scrapers and mechanical shovels, all construction equipment is subject to harsh working conditions.

Exposure to extreme working conditions hurt lubricant performance and lead to premature equipment failure.

Engineers today focus a lot on the design methodology of these engines which ensure that lubrication of these engines are contamination free— thus help reduce operating cost and also bring down the number of downtime.

In heavy-duty construction and industrial sites, a high-performance lubricated equipment can have a significant impact on operational success and meeting project deadline. There has been a tectonic shift to re-engineering heavy machinery to ensure efficiency and productivity. Here's a quick read on how one such complex problem was solved.



Customer

One of the world's top construction equipment manufacturer, wanted to reduce downtime of their machinery due to engine lubrication problem.

Business Scenario:

The customer wanted to develop a robust and efficient lubrication system for improving the performance and efficiency of their diesel engines used for different applications and lower the cost of manufacturing with optimized parts.

Main objectives of the project was to:

- Prevent water seepage in the engine which causes loss of power.
- Prevent injectors from getting dirty from the buildup of soot which leads to environmental issues.
- Re-design fuel injectors and combustion chambers, thereby helping to regain fuel economy, reduce emissions and lower the overall cost hours of operation.

Solution

As an SME in heavy engineering, AXISCADES, first re-engineered a prototype to support the design and development of system design. The refined product Engineering was done for the entire lubrication system including the subsystems. The engine's productivity and efficiency was tested and validated using virtual validation (FEA) which was also compatible to harsh outdoor conditions without impacting the lubrication of the engine.

Highlights of the solution

UV-resistant & withstands long-term harsh weather exposure.
Resistant to chemical wear and buildup
Designed integrated threads which minimized lubricator leakage.
Molded simple to install in hex nut for quick replacement of lubricators.
Integrated eyelet for attaching lubricant ID tags for visual inspection.

Why AXISCADES:

AXISCADES is a leading product engineering partner with deep domain expertise which can provide the upstream capability, product realization, design automation and integration Our certifications coupled with center of excellence positions AXISCADES as the innovation and design partner for global product development programs.